

WHAT IS CLAIMED IS:

1. A method for providing concurrent communication between a plurality of stations via radio transmissions in a time division multiplexing access (TDMA)

5 communications system, the method comprising the steps of:

(a) periodically broadcasting a signal message from said access point to said plurality of stations over a wireless communication channel, said signal message including a plurality of assigned time division multiplex (TDM) time slots;

(b) transmitting, by each said station, at least one data indicative of an interference
10 power level from adjacent stations in the respective assigned TDM time slot of said signal;

(c) determining optimal pairs of a transmitting station and a receiving station that are hidden from each other based on the received interference power level for said concurrent transmission; and,

(d) broadcasting said determination to said plurality of stations.

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2. The method as recited in Claim 1, further comprising the step of granting said concurrent transmission of information packets between said pairs of stations without the intervention of said access point.

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3. The method as recited in Claim 2, wherein the communication between said access point and said plurality of stations are performed via a time division multiplexing access (TDMA) technologies.

4. The method as recited in Claim 1, wherein said optimal pairs are selected if said receiving stations of said optimal pairs are different from each other.

5. The method as recited in Claim 1, wherein said optimal pairs are selected if said receiving station has been receiving signals consistently from the same transmitting station.

6. The method as recited in Claim 1, wherein said optimal pairs are selected if said receiving stations of said optimal pairs have not performed a handoff from one network to another network.

7. A method for providing concurrent communication between a plurality of stations via radio transmissions without the benefit of an access point, the method comprising the steps of:

(a) maintaining a table of active stations, said table including a current data transmission schedule and interference level;

(b) periodically broadcasting over a wireless communication channel a signal message from said AP to said plurality of stations, said message including a request to transmit at least one data indicative of interference power level information from adjacent stations;

(c) reporting, by each said station, said interference information to said access point via an assigned time division multiplex (TDM) time slot of said signal message by each said station;

(d) determining at least one pair of stations that are hidden from each other based on

said reported interference information for concurrent transmission; and,

(e) granting said concurrent transmission of information packets between said pairs of stations without the intervention of said access point.

5 8. The method as recited in Claim 7, wherein said signal message includes data indicative of (i) address of said plurality of stations, (ii) the present power level of said station for data transmission, (iii) the rate of said transmission for data transmission, and (iv) related information of said access point.

10 9. The method as recited in Claim 7, further comprising the step of broadcasting said determination to said plurality of stations.

15 10. The method as recited in Claim 7, further comprising the step of transmitting and receiving information packets between said stations without the intervention of said access point.

20 11. The method as recited in Claim 7, wherein the communication between said access point and the plurality of said stations are performed via time division multiplexing access (TDMA) technologies.

 12. The method as recited in Claim 7, wherein said concurrent transmission is granted if said receiving stations of said pairs are different from each other.

13. The method as recited in Claim 7, wherein said concurrent transmission is granted if said receiving station has been receiving signals consistently from the same transmitting station.

5 14. The method as recited in Claim 7, wherein said concurrent transmission is granted if said receiving stations of said pairs have not performed a handoff from one network to another network.

10 15. A radio transmission system for providing concurrent transmission in a wireless LAN, comprising:

a plurality of stations having a radio coverage area and being operative to transmit information via an assigned TDM time slot; and,

15 at least one access point in communication with said plurality of stations for broadcasting over a wireless communication channel a request to transmit data indicative of interference power level at which a particular station is able to receive from adjacent stations,

wherein data signals between multiples pairs of said stations can be exchanged concurrently without the benefit of said access point.

16. The system as recited in Claim 15, wherein said access point includes:

20 means for determining concurrent transmission candidates for said stations by comparing the interference level reported via said assigned TDM time slot to a prescribed power level for transmission;

means for modulating/demodulating signals received from/to said access point, and for transmitting said received signals at a different time slot from which said signals were received; and,

means for interfacing said plurality of stations to a WLAN and for exchanging signals
5 with said stations.

17. The system as recited in Claim 15, further comprising means for storing data indicative of a particular time at which said transmission of said data packet is scheduled to start and end.

18. The method as recited in Claim 15, wherein said access point provides timing signals for said plurality of stations.

19. The system of Claim 15, further comprising means for selecting said optimal
15 pairs based upon each receiving station in said optimal pairs being different from each other.

20. The system of Claim 15, further comprising means for selecting said optimal pairs based upon each receiving station in said selected pairs having received signals consistently for a predetermined time from the corresponding transmitting station within said
20 selected pairs.

21. The system of Claim 15, further comprising means for selecting said optimal pairs based upon said interference power level of a given station being greater than a threshold value.

5 22. The system of Claim 15, further comprising means for selecting said optimal pairs based upon determination that a handoff from one network to another network has not occurred within a predetermined time.

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